WHAT IS CLAIMED:

1. A method for detecting or quantitating gene expression in a sample, said sample believed to have one or more different types of unlabeled target nucleic acids, each type of target nucleic acid having an oligonucleotide tail, said method comprising:

providing a substrate having a plurality of types of capture nucleic acid sequences attached thereto in an array for the detection of multiple portions of a target nucleic acid, the detection of multiple different target nucleic acids, or both;

providing nanoparticles having oligonucleotides bound thereto, the oligonucleotides bound to the nanoparticles having a sequence that is complementary to at least a portion of the oligonucleotide tail;

contacting the sample, the substrate, and the nanoparticles, said contracting occurring under conditions effective for hybridization of the target nucleic acids to the capture nucleic acid sequences bound to the substrate and hybridization of the target nucleic acids to the nanoparticles; and

observing a detectable change.

2. The method of claim 1 wherein the target nucleic acid is RNA or DNA.

3. The method of claim 2 wherein the target nucleic acid is mRNA.

4. The method of claim 2 wherein the target nucleic acid is cDNA.

5. The method of claim 1 wherein the oligonucleotide tail comprises a poly dT, a poly dA, or a synthetic oligonucleotide having a predetermined sequence.

6. The method of claim 1 wherein the oligonucleotides bound to the nanoparticles comprise a poly dT, a poly dA, or a synthetic oligonucleotide having a predetermined sequence.

7. The method of claim 1 wherein the capture nucleic acid sequences comprise an oligonucleotide, cDNA, or genomic sequence fragment.

8. The method of claim 1 wherein the sample is first contacted with the substrate, said contacting occurring under conditions effective for hybridization of the target nucleic acids with the capture nucleic acid sequence bound to the substrate, and then contacting the target nucleic acid bound to the substrate with the nanoparticles, said contacting occurring under conditions effective for hybridization of the target nucleic acids bound to the substrate with the oligonucleotides bound to the nanoparticles.

9. The method of claim 1 wherein the sample is first contacted with the nanoparticles, said contacting occurring under conditions effective for hybridization of the target nucleic acids with the oligonucleotides bound to the nanoparticles, and then contacting the target nucleic acid bound to the nanoparticles with the substrate, said contacting occurring under conditions effective for hybridization of the target nucleic acids bound to the nanoparticles with the capture nucleic acid sequences bound to the substrate.

10. The method of claim 1 wherein the sample, nanoparticles and substrate are contacted simultaneously under conditions effective for hybridization of the target nucleic acids with the oligonucleotides bound to the nanoparticles and with the capture nucleic acid sequences bound to the substrate.

11. The method of claim 1 wherein the nanoparticles are made of gold.

12. The method of claim 1 wherein the detectable change is observed after contacting the substrate having target nucleic acids and nanoparticles with a staining material.

13. The method of claim 12 wherein the staining material is silver stain.

14. A method for detecting or quantitating gene expression in a sample, said sample believed to have one or more different types of unlabeled target ribonucleic acids,

each type of target ribonucleic acid including a poly dA oligonucleotide tail or a synthetic oligonucleotide tail of a predetermined sequence, said method comprising:

providing a substrate having a plurality of types of capture nucleic acid sequences attached thereto in an array for the detection of multiple portions of a target ribonucleic acid, the detection of multiple different target ribonucleic acids, or both;

providing nanoparticles having bound thereto poly dT oligonucleotides or a synthetic oligonucleotide sequence complementary to the sequence of the oligonucleotide tail;

contacting the sample, the substrate, and the nanoparticles, said contracting occurring under conditions effective for hybridization of the target ribonucleic acids to the capture nucleic acid sequences to the substrate and hybridization of the target ribonucleic acids to the nanoparticles; and

contacting the nanoparticles bound to the support with a staining material to produce a detectable change; and

observing the detectable change.

15. The method of claim 14 wherein the sample is first contacted with the substrate, said contacting occurring under conditions effective for hybridization of the target ribonucleic acids with the capture nucleic acid sequences bound to the substrate, and then contacting the target ribonucleic acid bound to the substrate with the nanoparticles, said contacting occurring under conditions effective for hybridization of the target ribonucleic acids bound to the substrate with the oligonucleotides bound to the nanoparticles.

16. The method of claim 14 wherein the sample is first contacted with the nanoparticles, said contacting occurring under conditions effective for hybridization of the target ribonucleic acids with the oligonucleotides bound to the nanoparticles, and then contacting the target ribonucleic acid bound to the nanoparticles with the substrate, said contacting occurring under conditions effective for hybridization of the target ribonucleic acids bound to the nanoparticles with the capture nucleic acid sequences bound to the substrate.

17. The method of claim 14 wherein the sample, nanoparticles and substrate are contacted simultaneously under conditions effective for hybridization of the target nucleic acids with the oligonucleotides bound to the nanoparticles and with the capture nucleic acid sequences bound to the substrate.

18. The method of claim 14 wherein the nanoparticles are made of gold.

19. The method of claim 14 wherein the staining material is silver stain.

20. The method of claim 14 wherein the capture nucleic acid sequences comprise an oligonucleotide, cDNA, or genomic sequence fragment.

21. A method for detecting or quantitating gene expression in a sample, said sample believed to have one or more different types of target cDNAs, each type of target cDNA including a poly dT oligonucleotide tail or a synthetic oligonucleotide tail having a predetermined sequence, said method comprising:

providing a substrate having a plurality of types of capture nucleic acid sequences attached thereto in an array for the detection of multiple portions of a target ribonucleic acid, the detection of multiple different target ribonucleic acids, or both;

providing nanoparticles having bound thereto poly dA oligonucleotides or synthetic oligonucleotides having a predetermined sequence;

contacting the sample, the substrate, and the nanoparticles, said contracting occurring under conditions effective for hybridization of the target cDNAs to the capture nucleic acid sequences bound to the substrate and hybridization of the target cDNAs to the nanoparticles; and

contacting the nanoparticles bound to the support with a staining material to produce a detectable change; and

observing the detectable change.

22. The method of claim 21 wherein the sample is first contacted with the substrate, said contacting occurring under conditions effective for hybridization of the

target cDNAs with the capture nucleic acid sequences bound to the substrate, and then contacting the target cDNAs bound to the substrate with the nanoparticles, said contacting occurring under conditions effective for hybridization of the target cDNAs bound to the substrate with the oligonucleotides bound to the nanoparticles.

23. The method of claim 21 wherein the sample is first contacted with the nanoparticles, said contacting occurring under conditions effective for hybridization of the target cDNAs with the oligonucleotides bound to the nanoparticles, and then contacting the target cDNAs bound to the nanoparticles with the substrate, said contacting occurring under conditions effective for hybridization of the target cDNAs bound to the nanoparticles with the capture nucleic acid sequences bound to the substrate.

24. The method of claim 21 wherein the target cDNAs, nanoparticles and substrate are contacted simultaneously under conditions effective for hybridization of the target cDNAs with the oligonucleotides bound to the nanoparticles and with the capture nucleic acid sequences bound to the substrate.

25. The method of claim 21 wherein the nanoparticles are made of gold.

26. The method of claim 21 wherein the staining material is silver stain.

27. The method of claim 21 wherein the capture nucleic acid sequences comprise an oligonucleotide, cDNA, or genomic sequence fragment.

28. A kit for detecting or quantitating gene expression in a sample, said sample believed to have one or more different types of unlabeled target nucleic acids, each type of target nucleic acid including a poly dT, poly dA oligonucleotide tail, or a synthetic oligonucleotide tail having a predetermined sequence, said kit comprising:

a substrate having a plurality of types of capture nucleic acid sequences attached thereto in an array for the detection of multiple portions of a target nucleic acid, the detection of multiple different target nucleic acids, or both; and

one or more types of nanoparticles having bound thereto poly dT oligonucleotides, poly dA oligonucleotides, or synthetic oligonucleotides having a predetermined sequence.

29. The method of claim 28 wherein the nanoparticles are made of gold.

30. The method of claim 28 wherein the capture nucleic acid sequences comprise an oligonucleotide, cDNA, or genomic sequence fragment.